

## **WHAT IS CLAIMED IS:**

1. A bipolar electrosurgical instrument, comprising:

inner and outer members each including an opposable seal surface disposed thereon;

at least one connector electrically coupling the opposable seal surfaces of the inner and outer members to a source of electrosurgical energy;

a stop for maintaining a minimum separation distance between the opposable seal surfaces; and

a ratchet disposed on one of the inner and outer members and at least one complementary interlocking mechanical interface disposed on the other of the inner and outer members, the ratchet and the interlocking mechanical interface adapted to maintain a closure pressure in the range of about 7 kg/cm<sup>2</sup> to about 13 kg/cm<sup>2</sup>.

2. A bipolar electrosurgical instrument, comprising:

first and second jaw members each including an opposable seal surface disposed thereon, the first and second jaw members being movable from a first position wherein the opposable seal surfaces are disposed in spaced-apart relation relative to one another to a second position wherein the opposable seal surfaces are disposed closer to one another to facilitate grasping tissue therebetween;

at least one connector in electrical communication with the opposable seal surfaces to electrically couple the opposable seal surfaces to a source of electrosurgical

energy to facilitate conducting electrosurgical energy through tissue disposed therebetween during usage of the instrument;

a stop disposed relative to at least one opposable seal surface to maintain a minimum separation distance between the opposable seal surfaces when the first and second jaw members are moved to the second position; and

a ratchet and a complementary interlocking mechanical interface each disposed relative to the first and second jaw members defining at least one interlocking position to maintain a closure pressure in the range of about 3 kg/cm<sup>2</sup> to about 16 kg/cm<sup>2</sup> between opposable seal surfaces.

3. A bipolar electrosurgical instrument according to claim 3 wherein the closure pressure is in the range of about 7 kg/cm<sup>2</sup> to about 13 kg/cm<sup>2</sup>.

4. A bipolar electrosurgical instrument according to claim 3 wherein the stop is disposed adjacent to at least one of the opposable seal surfaces.

5. A bipolar electrosurgical instrument according to claim 3 wherein the first and second jaw members are curved.

6. A bipolar electrosurgical instrument, comprising:

inner and outer members each including a jaw member having an opposable seal surface disposed thereon, the inner and outer members being movable from a first position wherein the opposable seal surfaces are disposed in spaced-apart relation relative to one another to a second position to facilitate grasping tissue between

the opposable seal surfaces, the opposable seal surfaces including a non-stick material for reducing tissue adhesion during the sealing process;

at least one connector in electrical communication with the opposable seal surfaces and adapted to electrically couple the opposable seal surfaces to a source of electrosurgical energy to facilitate conducting electrosurgical energy through tissue disposed therebetween during usage of the instrument;

at least one stop disposed adjacent to at least one of the opposable seal surfaces to maintain a minimum separation distance between the opposable seal surfaces when the inner and outer members are moved to the second position; and

a ratchet disposed on one of the inner and outer members and at least one complementary interlocking mechanical interface disposed on the other of the inner and outer members, the ratchet and the complementary interlocking mechanical interface defining at least one interlocking position to maintain a closure pressure in the range of about 3 kg/cm<sup>2</sup> to about 16 kg/cm<sup>2</sup> between opposable seal surfaces.

7. A bipolar electrosurgical instrument according to claim 6 wherein the non-stick material is a coating which is deposited on the opposable seal surfaces.

8. A bipolar electrosurgical instrument according to claim 7 wherein the non-stick coating is selected from the group of materials consisting of nitrides and nickel/chrome alloys.

9. A bipolar electrosurgical instrument according to claim 7 wherein the non-stick coating includes one of TiN, ZrN, TiAlN, CrN, nickel/chrome alloys with a Ni/Cr ratio of approximately 5:1, Inconel 600, Ni200 and Ni201.

10. A bipolar electrosurgical instrument according to claim 6 wherein the opposable seal surfaces are manufactured from a non-stick material.

11. A bipolar electrosurgical instrument according to claim 6 wherein the at least one stop is manufactured from an insulative material.

12. A bipolar electrosurgical instrument, comprising:

inner and outer members each including a jaw member having an opposable seal surface disposed thereon, the inner and outer members being movable from a first position wherein the opposable seal surfaces are disposed in spaced-apart relation relative to one another to a second position to facilitate grasping tissue between the opposable seal surfaces, at least one of the jaw members including a non-stick coating disposed on an outer surface thereof;

at least one connector in electrical communication with the opposable seal surfaces and adapted to electrically couple the opposable seal surfaces to a source of electrosurgical energy to facilitate conducting electrosurgical energy through tissue disposed therebetween during usage of the instrument;

at least one stop disposed adjacent to at least one of the opposable seal surfaces to maintain a minimum separation distance between the opposable seal surfaces when the inner and outer members are moved to the second position; and

a ratchet disposed on one of the inner and outer members and at least one complementary interlocking mechanical interface disposed on the other of the inner and outer members, the ratchet and the complementary interlocking mechanical interface defining at least one interlocking position to maintain a closure pressure in the range of about 3 kg/cm<sup>2</sup> to about 16 kg/cm<sup>2</sup> between opposable seal surfaces.

13. A bipolar electrosurgical instrument, comprising:

inner and outer members each including a jaw member having an opposable seal surface disposed thereon, the inner and outer members being rotatable about a pivot from a first position wherein the opposable seal surfaces are disposed in spaced-apart relation relative to one another to a second position to facilitate grasping tissue between the opposable seal surfaces, the opposable seal surfaces being tapered along a length thereof;

at least one connector in electrical communication with the opposable seal surfaces and adapted to electrically couple the opposable seal surfaces to a source of electrosurgical energy to facilitate conducting electrosurgical energy through tissue disposed therebetween during usage of the instrument;

at least one stop disposed relative at least one opposable seal surface to maintain a minimum separation distance between the opposable seal surfaces when the inner and outer members are moved to the second position; and

a ratchet disposed on one of the inner and outer members and at least one complementary interlocking mechanical interface disposed on the other of the inner and outer members, the ratchet and the complementary interlocking mechanical interface defining at least one interlocking position to maintain a closure pressure in the range of about 3 kg/cm<sup>2</sup> to about 16 kg/cm<sup>2</sup> between opposable seal surfaces.

14. A bipolar electrosurgical instrument according to claim 13 wherein the opposable seal surfaces are tapered along a length thereof extending from a proximal portion of the opposable seal surfaces to a distal portion of the opposable seal surfaces.